

Title: Computer Science Education at Grammar Schools

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Abstract:

Computer science is not a required component of general education in Czechia. The lack of published local experience impedes the search for general agreement in basic questions, such as: Is computer science in general education possible? Is it beneficial? What educational goals should it have, what topics should it cover? The goal of this thesis is to offer empirically verified answers to these questions, considering grammar school level (students 15–18 years old) in Czechia. A set of fundamental ideas of computer science has been identified and used to develop an introductory course. The course was repeatedly tested, evaluated and improved, following the design-based research methodology. The level of students' achievements as well as their own view of the novel approach to teach “informatics” was tracked. Contrary to the widely held belief (in Czechia), it turned out that computer science in general secondary education is possible and beneficial for the students, as long as the level of difficulty and specific goals are chosen appropriately. The course is available as an online textbook. The results of our work directly support the recent and ongoing effort to introduce computer science into the Czech educational system.

Keywords: computer science education, computational thinking, secondary general education, pedagogical content transformation, design-based research